

ATTORNEY DOCK NO.: 8571:76 CIP

PATENT  
Customer Number 22444**REMARKS****Objections to the Drawings**

The Examiner stated that the sheets of drawings filed on April 8, 2002 have been received but not approved because the Applicants have not submitted a proposed drawing correction in the form of a pen-and-ink sketch showing the changes in red.

The Applicants respectfully submit herewith pen-and-ink changes to the drawings in red as required under MPEP §608.2(v).

The Applicants respectfully submit that flow arrows for the injected fluid have been added to Figures 2B, 3B, 3C, 3D, and 3E. The Applicants respectfully submit that the pitch vector has been modified in Figure 5B to more clearly show that this vector has a vertical component directing the vector into the page.

The Applicants respectfully submit that the angle for 286 of 15° is relative to the longitudinal axis of the engine.

The Applicants respectfully submit that these changes to the drawings address the Examiner's objections and request that these objections be withdrawn and the drawings entered.

**Claim Rejections Under 35 USC § 112**

The Applicants respectfully submit that independent Claims 31, 44, 51, and 63 have been amended to overcome the Examiner's rejections for the use of negative limitations.

Therefore, the Applicants request that the Examiner withdraw the objections to amended claims under 35 USC § 112.

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Applicants have now made an earnest attempt to adopt the Examiner's suggestions and to present rejected claims in better form for consideration on appeal. For the foregoing reasons and for other reasons clearly apparent, Applicants respectfully request withdrawal of the cited rejections.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayments to Deposit Account No. 50-1343 of Hughes & Luce, LLP.

If the Examiner has any questions or comments, or if further clarification is required, it is requested that the Examiner contact the undersigned at the telephone number listed below.

Respectfully submitted,

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31. (Amended) [A nozzle for vectoring a primary flow of a fluid flowing through an enclosed volume, the nozzle being a 3-D nozzle and having an inside surface, the nozzle comprising:

a plurality of injectors with port openings arranged along the inside surface of the 3-D nozzle, each of the plurality of injectors adapted to expel an injection fluid in a direction within the enclosed volume, the direction inclined to oppose the primary flow of the fluid and approximately parallel to an intended vectoring plane.] A system for vectoring a primary flow by varying an effective throat or sonic plane within a ducted primary flow, comprising:

an opening for accepting the primary flow;

at least one primary injector located wherein said at least one injector is inclined to oppose the primary flow up-stream of said effective throat or sonic plane;

at least one supplemental injector wherein said at least one supplemental injector is located downstream of the at least one primary injector, wherein said at least one supplemental injector is inclined to oppose the primary flow, and wherein the at least one primary and supplemental injectors provide a flow field opposed to a subsonic portion of the primary flow in order to vector the primary flow; and

at least one controller operable to direct said at least one primary and supplemental injector to provide a flow operable to vary the effective throat or sonic plane.

32. (Amended) The [nozzle of] system for vectoring a primary flow of Claim 31, [the nozzle] further comprising:

a physical throat, [the] within a duct, wherein the physical throat [comprising] comprises a region [within the nozzle] of lowest cross-sectional area, [the throat being] [situation] in [a path of] the primary flow [of the fluid].

33. (Amended) The [nozzle] system for vectoring a primary flow of Claim 32 wherein [the] a plurality of primary injectors is located proximate to [the] said physical throat.

34. Cancelled.

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35. (Amended) The [nozzle]system for vectoring a primary flow of Claim [34]31 wherein [the plurality of]injectors [and the second plurality of injectors expel the injection]inject fluid asymmetrically, to[resulting in a change in a thrust]redirect [vector associated with]the primary flow [of the fluid, the change in the thrust vector lying within]along [the]an intended vectoring plane.

36. (Amended) The [nozzle]system for vectoring a primary flow of Claim 35 wherein [the]a plurality of primary and secondary injectors [and the second plurality of injectors] inject fluidic[expel the injection fluid in] pulses.

37. (Amended) The [nozzle] system for vectoring a primary flow of Claim 33, [the nozzle further comprising:]wherein a [a second]plurality of secondary injectors [located proximate to the throat, the second plurality of injectors having port openings]are arranged [along the inside surface opposite of the plurality of injectors, each of the second plurality of injectors adapted to expel the injection]to inject fluid [in a second direction within the enclosed volume, the second direction inclined]to oppose the primary flow [of the fluid and approximately]and in parallel to the intended vectoring plane.

38. (Amended) The [nozzle]system for vectoring a primary flow of Claim 37 wherein the plurality of primary injectors and the [second] plurality of secondary injectors [expel the injection]inject fluid symmetrically, resulting in a change in a discharge coefficient in the nozzle.

39. Cancelled.

40. (Amended) The [nozzle]system for vectoring a primary flow of Claim 31 wherein [the injection]injected fluid [is a]comprises compressed gas.

41. (Amended) The [nozzle]system for vectoring a primary flow of Claim 31 wherein [the injection]injected fluid comprises fuel.

42. (Amended) The [nozzle]system for vectoring a primary flow of Claim 31, [the nozzle]further comprising:

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at least one controller, [the at least one controller] operable to direct [at least one of the plurality of injectors to expel the injection fluid]said at least one primary injector and/or said at least one supplemental injector.

43. Cancelled.

44. (Amended) A method for vectoring a primary flow of fluid in a 3-D nozzle, [the 3-D nozzle having a throat, the throat comprising a region within the 3-D nozzle of lowest cross-sectional area, the throat being situated in a path of the primary flow of fluid, the method] comprising the steps of:

[expelling]injecting fluid from a plurality of primary injectors [an injection fluid in a direction inclined to oppose the]opposed to a primary flow of the fluid and approximately parallel to an intended vectoring plane, the plurality of injectors located proximate to [the]a throat[.]:

injecting fluid from a plurality of supplemental injectors opposed to the primary flow wherein said second plurality of supplemental injectors are located downstream of the throat, and wherein the fluid injected by said primary and/or supplemental injectors varies or skews an effective throat or sonic plane of said 3-D nozzle.

45. Cancelled.

46. (Amended) The method of Claim 44, [the method] further comprising:

expelling from a second plurality of injectors the injection fluid in a direction inclined to oppose the primary flow of the fluid and approximately parallel to an intended vectoring plane, [the second]wherein said supplemental plurality of injectors are located [approximate]proximate to the throat.

47. (Amended) The method of Claim 44 wherein [the step of expelling comprises expelling in pulses.]fluid is injected by said primary and/or supplemental injectors in fluidic pulses.

48. (Amended) The method of Claim 44 wherein the [injection]injected fluid [is]comprises a compressed gas.

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49. (Amended) The method of Claim 44 wherein the ~~[injection]~~injected fluid ~~[is a]~~comprises fuel.

50. Cancelled.

51. (Amended) A ~~[nozzle for]~~system for vectoring a primary flow ~~[of fluid, the primary flow of fluid flowing through an enclosed volume, the]~~comprising:

a nozzle having an ~~[inside]~~inner surface and a throat, wherein the throat ~~[comprising]~~comprises a region within the nozzle of lowest cross-sectional area, the throat being situated in a path of the primary flow of fluid[.]; ~~[the nozzle comprising:]~~

a plurality of primary injectors ~~[with port openings]~~arranged along the ~~[inside]~~inner surface of the nozzle, the plurality of injectors arranged ~~[such that the plurality of injectors are not aligned parallel to the path of the primary flow of fluid, each of the plurality of injectors adapted to expel an injection fluid in a direction within the enclosed volume, the direction inclined]~~to oppose the primary flow of fluid ~~[and]~~in a first ~~[approximately parallel to an]~~ intended vectoring plane[.], and wherein said primary injectors skew an effective throat or sonic plane within said nozzle; and

at least one controller operable to direct said at least one primary and supplemental injector to provide a flow operable to vary the effective throat or sonic plane.

52. (Amended) The ~~[nozzle]~~system for vectoring a primary flow of Claim 51 wherein the plurality of injectors is located proximate to the throat.

53. (Amended) The ~~[nozzle]~~system for vectoring a primary flow of Claim 52, ~~[the nozzle]~~further comprising:

a ~~[second]~~plurality of supplemental injectors located downstream of the throat and arranged along the ~~[inside]~~inner surface of the nozzle, ~~[the second plurality of injectors arranged such that the second plurality of injectors are not aligned parallel to the path of the primary flow of fluid, each of the second plurality of injectors adapted to expel the injection fluid in a second direction within the enclosed volume, the second direction inclined]~~to oppose the primary flow ~~[of the fluid and approximately parallel to the]~~in a second intended vectoring plane.

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54. (Amended) The [nozzle]system for vectoring a primary flow of Claim 53 wherein the plurality of primary and supplemental injectors [and the second plurality of injectors expel the injection]inject fluid asymmetrically, resulting in a change in a thrust vector associated with the primary flow of the fluid, the change in the thrust vector lying within the first and/or second intended vectoring plane.

55. (Amended) The [nozzle]system for vectoring a primary flow of Claim 54 wherein the plurality of primary and supplemental injectors [and the second plurality of injectors expel the injection fluid in pulses]inject fluidic pulses.

56. (Amended) The [nozzle]system for vectoring a primary flow of Claim [52]53, [the nozzle further comprising:]wherein said supplemental injectors are:

[a second plurality of injectors]located proximate to the throat[, the second plurality of injectors having port openings arranged along the inside surface opposite of the plurality of injectors, the second plurality of injectors arranged such that the second plurality of injectors are not aligned parallel to the path of the primary flow of fluid, each of the second plurality of injectors adapted to expel the injection fluid in a second direction within the enclosed volume, the second direction inclined to oppose the primary flow of the fluid and approximately parallel to the intended vectoring plane].

57. (Amended) The [nozzle]system for vectoring a primary flow of Claim 56 wherein the plurality of primary and/or supplemental injectors [and the second plurality of injectors expel the injection]inject fluid symmetrically, resulting in a change in a discharge coefficient [in]for the nozzle.

58. Cancelled.

59. (Amended) The [nozzle]system for vectoring a primary flow of Claim 51 wherein the [injection]injected fluid [is a] comprises compressed gas.

60. (Amended) The [nozzle]system for vectoring a primary flow of Claim 51 wherein the [injection]injected fluid [is] comprises fuel.

61. (Amended) The [nozzle]system for vectoring a primary flow of Claim [54]53, [the nozzle] further comprising:

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at least one controller, [the at least one controller] operable to direct [at least one of the plurality of] said primary and/or supplemental injectors [to expel the injection fluid].

62. (Amended) The [nozzle] system for vectoring a primary flow of Claim [51] 61, [the nozzle further comprising:]

wherein said at least one controller, [the at least one controller operable to direct] directs [at least one of the plurality of] said primary and/or supplemental injectors to [expel of the injection] inject [fluid in pulses] fluidic pulses.

63. (Amended) A method for vectoring a primary flow [of fluid in a nozzle, the nozzle having a throat, the throat comprising a region within the nozzle of lowest cross-sectional area, the throat being situated in a path of the primary flow of fluid, the method] within a nozzle comprising the steps of:

[expelling] injecting from a plurality of primary injectors [an injection] a fluid [in a direction inclined to oppose] opposed to the primary flow [of the fluid and approximately parallel to an intended vectoring plane, the] wherein said plurality of primary injectors are located proximate to [the] a throat [and arranged such that the plurality of injectors are not aligned parallel to the path of the primary flow of fluid] of the nozzle [.] ;

injecting from a plurality of supplemental injectors fluid to oppose the primary flow, the plurality of supplemental injectors located downstream of the throat, wherein said injected fluid skews or varies an effective throat or sonic plane within the nozzle.

64. Cancelled.

65. (Amended) The method of Claim 63, [the method further comprising:

expelling from a second plurality of injectors an injection fluid in a direction inclined to oppose the primary flow of the fluid and approximately parallel to an intended vectoring plane, the second plurality of injectors located approximate to the throat and arranged such that the second plurality of injectors are not aligned parallel to the path of the primary flow of fluid] wherein said supplemental injectors are located proximate to the throat.



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66. (Amended) The method of Claim 63 wherein [the step of expelling comprises expelling in pulses]fluid is injected as fluidic pulses.

67. (Amended) The method of Claim 63 wherein the [injection]injected fluid [is a]comprises compressed gas.

68. (Amended) The method of Claim 63 wherein the [injection]injected fluid [is a]comprises fuel.

69. Cancelled.

70. Cancelled.

71. Cancelled.

72. Cancelled.

73. Cancelled.

74. Cancelled.